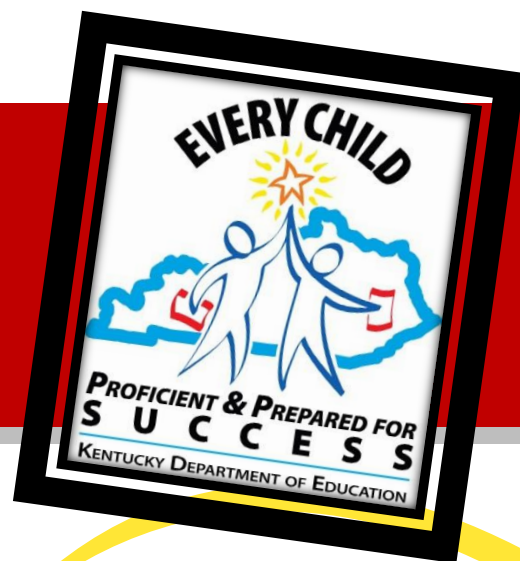


Math Interventions Update

A Monthly Update for the Latest in Math Interventions

January 2013

Volume 1 – Issue 2



Intervention Talk

Interventions have become an important way for teachers to ensure that all students are successful. Helping students who are struggling with mathematics requires teachers to choose an appropriate time and strategy for the intervention. Without a systematic approach, this can be a challenge for teachers who have multiple students in need of help.

Each month, I will provide a couple of intervention strategies for math teachers. This month I will begin with strategies to help you identify students who may benefit from intervention.

Use Formal and Informal Assessments

No single instructional strategy is more important than effective, appropriate, and informative assessment. It is critical that teachers are well-informed about their students' understanding and mastery of content. But assessment should also be handled with restraint—too much testing may produce students who are weary and overwhelmed. Use the following techniques when assessing your students.

- Use informal techniques frequently during regular class time to gauge student understanding.
- Use questioning that focuses on student thinking and reasoning to help you monitor your students.
- Incorporate writing activities and group work to observe student thinking and identify misconceptions and gaps in understanding.
- Have students illustrate concepts using drawings, graphs, and models.

Integrate Warm-Up Activities The use of quick warm-up activities in class can be beneficial for several reasons. One of the most common reasons students may need intervention is that they have not fully mastered prerequisites. You can use warm-up activities to review prerequisites and to gauge student mastery. Begin your lessons by having your students complete several problems that cover prerequisites. This technique will also give you time to circulate among your students and have quiet one-on-one conversations. These discussions can be used as valuable informal assessment opportunities.

Write to Learn

Having students write in math class can help you identify areas of misunderstanding and gaps in understanding. Begin your instructional units by having your students write explanations of several key prerequisites. Students may feel more comfortable writing and may be more apt to expose their weaknesses in their writing. This can be especially true for struggling students who may be inclined to stay quiet during discussions. Use math journals to have students record the steps they undertook to solve a problem. You can use their explanations as a form of error analysis to help you identify gaps in understanding.

Assign Application Problems

Make sure that you utilize a variety of techniques to gauge depth of understanding in your students. Some students who have a cursory understanding of a topic may be able to perform relatively well on standard assessment questions. However, the lack of mastery of a concept can be illuminated via application problems. This exercise can be especially important prior to moving on to a new concept. An application problem can identify students who have not thoroughly mastered a concept and who will likely require intervention if they move on to a new concept too soon.

Resource: http://www.glencoe.com/sec/teachingtoday/subject/intervention_strategies.phtml

Department of Education
Office of Next-Generation Learners
Division of Learning Services
Differentiated Learning Branch
Division Director: Johnny Collett
Branch Manager: April Pieper
Mathematics Intervention Consultant: Pamela Pickens

Mathematics Achievement Fund (MAF)

Monthly Update/Focus

Mid-Year Report DUE January 18th, 2013

The mid-year report for the Kentucky Department of Education is due Friday, January 18th, 2013. The documents needed to complete the mid-year report are included in the January e-mail. Please use the document "*Directions for Recording Attendance MAF*" when entering information into the Excel Spreadsheet "*Attendance Data Entry Sheet MAF*". When saving the Excel Spreadsheet, please save as your district followed by your school name. For example: South Elementary in Adair County would be saved as Adair – South Elementary. Submit completed excel document to pamela.pickens@education.ky.gov by January 18th, 2013.

Survey DUE January 18th, 2013

A mid-year survey has been posted to Survey Monkey for completion by Friday, January 18th, 2013. A copy of the survey is included in the January e-mail for your convenience. You may want to print the survey and answer questions on paper before completing the actual online survey.

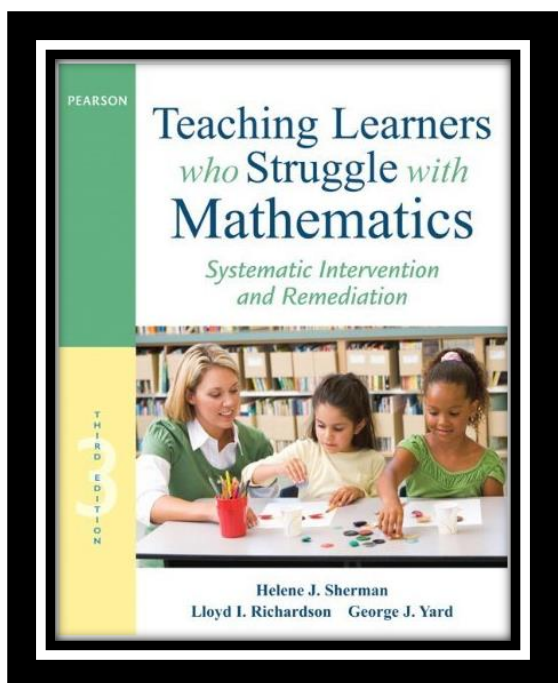
Survey Link - <http://www.surveymonkey.com/s/CG6MF9V>

Recommended Reading

Teaching Learners Who Struggle with Mathematics: Responding With Systematic Intervention and Remediation (3rd Edition)

by Helene J. Sherman, Lloyd I. Richardson and George J. Yard (Apr 23, 2012)

This book is designed for aspiring and practicing teachers who will work or are working with K-6 students in need of remediation and additional math instruction. Addressing the mathematical concepts students struggle with the most (including place value, addition and subtraction of whole numbers, multiplication, division, fractions, and time and money), this book analyzes the roots and causes of frequent error patterns in student work and offers implementable solutions for solving them and teaching lifelong math skills.



Mathematical Practice of the Month

To emphasize the Mathematical Practices, the CCSS gives them their own distinct section, but they are not to be thought of as a separate skill set to be handled in special lessons or supplements. The intent is that these *essential mathematical habits of mind and action* pervade the curriculum and pedagogy of mathematics, K–12, in age-appropriate ways.

2 - Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

Resource: Common Core State Standards Initiative <http://www.corestandards.org/>

Anchor Charts for this Mathematical Practice

Resource: Jordan School District <http://elemmath.jordandistrict.org/files/2012/05/Standard-21.pdf>

Reason abstractly and quantitatively.
Mathematical Practice 2


I can use numbers and words to help me make sense of problems.

Numbers to Words

$2 + 3 = 5$


↓

I have 2 yellow flowers and 3 red flowers.
How many flowers altogether?



Words to Numbers

I have 2 yellow flowers and 3 red flowers.
How many flowers altogether?



↓

$2 + 3 = 5$

Left – K-1

Right – 2-3

Bottom – 4-5

Reason abstractly and quantitatively.
Mathematical Practice 2

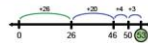
I can use numbers and words to help me make sense of problems.

Numbers to Words

$26 + 27 = 53$


↓

There are 26 boys and 27 girls on the playground.
How many children are on the playground?



Words to Numbers

There are 26 boys and 27 girls on the playground.
How many children are on the playground?



↓

$26 + 27 = 53$

Reason abstractly and quantitatively.
Mathematical Practice 2

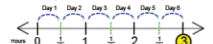
I can use numbers, words, and reasoning habits to help me make sense of problems.

Contextualize (Numbers to Words)

$\frac{1}{2} \times 6 = 3$ or $6 \times \frac{1}{2} = 3$


↓

Mary practices the piano $\frac{1}{2}$ hour a day for 6 days.
How many total hours does she practice?



Decontextualize (Words to Numbers)

Mary practices the piano $\frac{1}{2}$ hour a day for 6 days.
How many total hours does she practice?



↓

$\frac{1}{2} \times 6 = 3$ or $6 \times \frac{1}{2} = 3$

Reasoning Habits

- 1) Make an understandable representation of the problem.
- 2) Think about the units involved.
- 3) Pay attention to the meaning of the numbers.
- 4) Use the properties of operations or objects.

Spotlight on CIITS

What is CIITS?

CIITS stands for the Continuous Instructional Improvement Technology System – a tool designed to pull standards, instructional materials, lesson plans, assessments, data and professional development all together into an integrated online resource. CIITS is a one-stop shop that provides Kentucky educators with the resources aligned to standards that support highly effective teaching and learning in their classrooms, schools and districts.

Featured Link this Month: Kentucky Learning Depot

The KY Learning Depot repository is Kentucky's digital repository for quality digital learning content. The repository provides an environment for educators to search for, use, remix, share, and contribute educational resources.

The diverse collections available for searching contain a wide range of resources. Resources are free for educational use but may be protected through various copyright statements associated with each resource.

Collections Open to the Public

- Depot Learning Resources
- Kentuckiana Digital Library
- KET Resources
- Harvested resources



Dates to Remember

- January 18th – Mid-Year Report and Survey Due to KDE – send to pamela.pickens@education.ky.gov
- January 18th – Poster Submissions Due (optional for all MITs)
- January 25th – Midyear Data and DOR submission deadline – send files to mitdata@nku.edu (All MITs)
- February 25th - 26th – Annual KCM Conference



School-Wide Strategies for Managing Mathematics

Applied Problems: Improving Performance Through a 4-Step Problem-Solving Approach (Pólya, 1957; Williams, 2003). Students can consistently perform better on applied math problems if they follow an efficient 4-step plan of understanding the problem, devising a plan, carrying out the plan, and looking back. (1) UNDERSTAND THE PROBLEM. To fully grasp the problem, the student may restate the problem in his or her own words, note key information, and identify missing information. (2) DEVISE A PLAN. In mapping out a strategy to solve the problem, the student may make a table, draw a diagram, or translate the verbal problem into an equation. (3) CARRY OUT THE PLAN. The student implements the steps in the plan, showing work and checking work for each step. (4) LOOK BACK. The student checks the results. If the answer is written as an equation, the student puts the results in words and checks whether the answer addresses the question posed in the original word problem.

Article Excerpt from *Intervention Central*. Read the entire the article at

<http://www.interventioncentral.org/academic-interventions/math/school-wide-strategies-managing-mathematics>

Wonderful Websites

- **Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools** - This 2009 practice guide from the What Works Clearinghouse provides eight recommendations to help teachers, principals, and school administrators use RtI to identify students who need assistance in mathematics and to address the needs of these students through focused interventions. Each recommendation has practical suggestions for implementation.
http://ies.ed.gov/ncee/wwc/pdf/practice_guides/rti_math_pg_042109.pdf
- **Using Mnemonic Instruction to Teach Math** - This brief illustrates mnemonics that are useful in teaching math facts, order of operations, measurement, geometry, problem-solving techniques, and other areas of math to students with disabilities
http://www.k8accesscenter.org/training_resources/documents/Mnemonicinstruction-math-4-20-05.pdf
- **Concrete-Representational-Abstract Instructional Approach** - Provides an overview of the Concrete-Representational-Abstract (CRA) Instructional Approach and discusses how this intervention can be used to improve math instruction.
http://www.k8accesscenter.org/training_resources/documents/CRAApplicationFinal_000.pdf